

In the Claims

Please withdraw claims 17, 18, 20, 22 and 26-31.

1. (Previously Amended) A method for packaging a microelectronic substrate, comprising:

disposing an encapsulating material in direct contact with a surface of the microelectronic substrate; and

exposing at least a portion of the surface of the microelectronic substrate by removing a portion of the encapsulating material in direct contact with the surface of the microelectronic substrate with the microelectronic substrate in an operable condition after the portion of the encapsulating material is removed.

2. (Original) The method of claim 1 wherein the microelectronic substrate has a first surface and a second surface facing opposite the first surface, the first surface having a plurality of bond sites for electrical connections to the microelectronic substrate, and further wherein exposing a portion of a surface of the microelectronic substrate includes exposing a portion of the second surface of the microelectronic substrate.

3. (Previously Amended) The method of claim 1, further comprising:  
mounting the microelectronic substrate to a support member with a first surface of the microelectronic substrate facing the support member and a second surface of the microelectronic substrate facing away from the support member;

electrically coupling the microelectronic substrate to the support member;

disposing the encapsulating material adjacent to both the microelectronic substrate and the support member; and

exposing at least a portion of the second surface of the microelectronic substrate by directing laser radiation toward the portion of the encapsulating material in direct contact with the second surface to ablate the portion of the encapsulating material.

4. (Original) The method of claim 1, further comprising:  
selecting the microelectronic substrate to include a memory chip;  
mounting the microelectronic substrate to a printed circuit board; and  
disposing the encapsulating material adjacent to both the printed circuit board and the microelectronic substrate.
5. (Original) The method of claim 1, further comprising transferring heat directly away from the exposed portion of the surface of the microelectronic substrate.
6. (Original) The method of claim 1, further comprising convectively transferring heat directly away from the exposed portion of the surface of the microelectronic substrate.
7. (Original) The method of claim 1 wherein removing a portion of the encapsulating material includes directing laser radiation toward the encapsulating material.
8. (Original) The method of claim 1 wherein removing the portion of the encapsulating material includes directing a laser beam having a power of from about 4 watts to about 25 watts toward the encapsulating material.
9. (Original) The method of claim 1 wherein removing the portion of the encapsulating material includes sequentially removing layers of the portion of the encapsulating material by sequentially exposing the layers of encapsulating material to laser radiation.
10. (Previously Amended) A method for packaging a microelectronic substrate, comprising:  
disposing an encapsulating material in direct contact with the microelectronic substrate; and

forming a heat transfer structure in an external surface of the encapsulating material by manipulating at least a portion of the encapsulating material in direct contact with the microelectronic substrate to define at least one exposed heat transfer surface of the heat transfer structure.

11. (Original) The method of claim 10 wherein manipulating at least a portion of the encapsulating material includes removing a portion of encapsulating material by directing laser radiation toward the encapsulating material.

12. (Previously Amended) The method of claim 10 wherein the microelectronic substrate has a first surface and a second surface facing opposite the first surface, the first surface having a plurality of bond sites for electrical connections to the microelectronic substrate, and further wherein manipulating at least a portion of the encapsulating material includes removing a portion of the encapsulating material in direct contact with the second surface of the microelectronic substrate.

13. (Original) The method of claim 10, further comprising:  
mounting the microelectronic substrate to a support member;  
electrically coupling the microelectronic substrate to the support member;  
disposing the encapsulating material adjacent to both the microelectronic substrate and the support member; and  
removing at least a portion of the encapsulating material from a region proximate to the microelectronic substrate.

14. (Original) The method of claim 10 wherein manipulating the encapsulating material includes removing a portion of the encapsulating material to expose a portion of a surface of the microelectronic substrate initially covered by the encapsulating material.

15. (Original) The method of claim 10 wherein forming a heat transfer structure includes forming a cylindrical rod of encapsulating material projecting away from the microelectronic substrate.

16. (Original) The method of claim 10 wherein forming a heat transfer structure includes forming a rib projecting away from the microelectronic substrate.

17. (Withdrawn)

18. (Withdrawn)

19. (Cancelled)

20. (Withdrawn)

21. (Cancelled)

22. (Withdrawn)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Withdrawn)

27. (Withdrawn)

28. (Withdrawn)

29. (Withdrawn)

30. (Withdrawn)

31. (Withdrawn)

32. (Original) A method for packaging a microelectronic substrate, comprising:

mounting the microelectronic substrate to a support member with a first surface of the microelectronic substrate facing the support member and a second surface of the microelectronic substrate facing opposite the first surface;

electrically coupling the microelectronic substrate to the support member by passing wire bonds through an aperture in the support member and connecting one end of each wire bond to the support member and an opposite end of each wire bond to the microelectronic substrate;

encapsulating the microelectronic substrate and the support member by disposing an encapsulating material over the support member and the second surface of the microelectronic substrate; and

directing a source of laser radiation toward the second surface of the microelectronic substrate to remove at least a portion of the encapsulating material adjacent to the second surface and expose the second surface.

33. (Original) The method of claim 32, further comprising forming a heat transfer feature in the encapsulating material by removing a portion of the encapsulating material to define an exposed external surface of the heat transfer feature.

34. (Original) The method of claim 32 wherein directing the source of laser radiation includes directing a laser beam having a power of from about 4 watts to about 25 watts.

35. (Original) The method of claim 32 wherein directing the source of laser radiation includes engaging a laser beam with the encapsulating material to remove a first portion of the encapsulating material and engaging the laser beam with the encapsulating material again to remove a second portion of the encapsulating material initially covered by the first portion of the encapsulating material.

36. (Original) The method of claim 32 wherein removing a portion of the encapsulating material includes removing a layer of encapsulating material having a thickness of greater than about 0.003 inch.

37. (Withdrawn)

38. (Withdrawn)

39. (Withdrawn)

40. (Withdrawn)

41. (Withdrawn)

42. (Withdrawn)

43. (Withdrawn)

44. (Withdrawn)

45. (Withdrawn)

46. (Withdrawn)

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